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(54) Clamp-on ultrasonic flowmeter

(57) A clamp-on ultrasonic flowmeter has a pair of ultrasonic transmitting-receiving devices which are placed on a pipe in which a liquid flows. Each device is composed of a composite of an ultrasonic transducer and an ultrasonic propagating element which propagates ultrasonic wave transmitted by the transducer predominantly in the direction perpendicular to a plane of the transducer (which is arranged at an acute angle from the center line of the pipe), and an ultrasonic propagating

layer placed between the ultrasonic propagating element and the pipe. The ultrasonic propagating layer has a viscosity of  $0.5 \times 10^{-3}$  to  $3 \times 10$  Pa·sec at 25°C and a rate of sonic propagation in terms of  $V_1$  at 25°C satisfying the condition of  $0.5 < V_1/V_2 < 1.7$  in which  $V_2$  represents a rate of sonic propagation of material of the pipe at 25°C. Otherwise, the ultrasonic propagating layer has a rate of penetration of needle in the range of 10 to 300 at 25°C and a rate of sonic propagation satisfying the same condition.

FIG. 1

